R2795

Sub. Code
509201

M.Sc. DEGREE EXAMINATION, APRIL – 2025

Second Semester

Zoology

ANIMAL PHYSIOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option.

1. The ring of cartilage that surrounds the trachea is called (CO1, K1)

   (a) Treillage (b) Voicebox

   (c) Cricoid cartilage (d) Arytenoids cartilage

2. The blood cells that protect the body from microbes and other foreign substances are (CO1, K1)

   (a) Leukocytes (b) Platelets

   (c) Lymphocytes (d) Erythrocytes

3. The walls of the ventricles possess thick muscular projections, they are known as (CO2, K3)

   (a) Conus arteriosus

   (b) Truncus arterosus

   (c) Chordae tendineae

   (d) Columnae carneae

4. Ventricular muscle depolarization is indicated by (CO2, K3)

(a) PR interval (b) P wave

(c) U wave (d) The QRS complex

5. Muscle fatigue is due to the accumulation of (CO3, K4)

(a) Lactic acid

(b) Carbon dioxide

(c) Creatine phosphate

(d) ADP

6. A common connective tissue layer holding together the skeletal muscle bundle is (CO3, K4)

(a) Aponeurosis (b) Fascia

(c) Endomysium (d) Perimysium

7. Which of the following characteristics of a system is most likely to result in a stable homeostatic system? (CO4, K4)

(a) Unfavourable feedback

(b) Positive reaction

(c) Redundancy is a term that refers to a situation in which

(d) Complicatedness

8. During catabolism of amino acids, the release of amino group is known as (CO4, K4)

(a) Deamination (b) Hydrolysis

(c) Ammunition (d) Hydration

9. Which of the following gland is responsible for the development of milk secreting glands? (CO5, K2)

(a) Thyroid gland (b) Parathyroid gland

(c) Pineal gland (d) Pituitary gland

10. Which one of the following hormones is a tyrosine derivative? (CO5, K2)

(a) Epinephrine (b) Estradiol

(c) Progesterone (d) Testosterone

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Give a brief account of the blood corpuscles. (CO1, K1)

Or

(b) Explain-Digestive system of human. (CO1, K1)

12. (a) Write short note on ECG and its principles. (CO2, K3)

Or

(b) Draw the labelled structure of human heart. (CO2, K3)

13. (a) Explain different types of muscles. (CO3, K4)

Or

(b) Write an account on sensory organs. (CO3, K4)

14. (a) Write an account on poikilothermic animals. (CO4, K4)

Or

(b) Write an account on hormonal control osmoregulation. (CO4, K4)

15. (a) List of the endocrine glands in humans and its functions. (CO5, K2)

Or

(b) Describe about circadian rhythm. (CO5, K2)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Write an essay on gastrointestinal enzymes and its functions. (CO1, K1)

Or

(b) Discuss in detail about the function of plasma in Blood. (CO1, K1)

17. (a) Enumerate the structure and functions of heart with neat diagram. (CO2, K3)

Or

(b) Write a detailed note on the blood pressure. (CO2, K3)

18. (a) Write an essay on structure and functions of human eye with neat diagram. (CO3, K4)

Or

(b) Write an essay on structure and functions of central nervous system. (CO3, K4)

19. (a) Write an essay on osmoregulation in aquatic animals. (CO4, K4)

Or

(b) Discuss in detail about homeostasis. (CO4, K4)

20. (a) Draw a neat diagram of Adenohypophysis and its functions. (CO5, K2)

Or

(b) Write a detailed note of pineal gland and its functions. (CO5, K2)

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R2796

Sub. Code
509202

M.Sc. DEGREE EXAMINATION, APRIL – 2025

Second Semester

Zoology

IMMUNOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option.

1. The antibody that can cross the placenta is _____. (CO1, K2)

   (a) IG E (b) IG A

   (c) IG G (d) IG M

2. This lymphoid organ is called as burial ground of RBC (CO1, K1)

   (a) Thymus (b) Spleen

   (c) Bone marrow (d) None of these

3. Antibodies are derived from (CO2, K1)

   (a) T-helper cells (b) T-cytotoxic cells

   (c) B-Cells (d) None of these

4. Humoral immunity is performed by (CO2, K1)

   (a) Thymus (b) T-cells

   (c) Antibodies (d) None of these

5. The initial complement component that is bound by complement fixing antibody is (CO3, K3)

(a) C1q (b) C1s

(c) C3b (d) C9

6. Which of the following is the secondary lymphoid organ? (CO3, K2)

(a) Bone marrow (b) Thymus

(c) Thyroid (d) Lymph node

7. The cytokine that produced during viral infection is (CO4, K2)

(a) Lymphokine (b) Interferon

(c) Chemokine (d) Monokine

8. Primary immune response is produced by (CO4, K2)

(a) IG G (b) IG M

(c) IG D (d) IG E

9. The macrophages that found on the brain and spinal chord are (CO5, K2)

(a) Monocytes (b) Kupffer cells

(c) B-cells (d) Microglial cells

10. Substance that does not stimulate immune response unless bind to larger molecule (CO5, K3)

(a) Hapten (b) Antigen

(c) Antibody (d) None of these

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) What are the contribution of Luis Pasteur to immunology? (CO1, K2)

Or

(b) Briefly discuss about the history of vaccination. (CO1, K2)

12. (a) Write short note on innate immunity. (CO2, K2)

Or

(b) Discuss about the difference between active and passive immunity. (CO2, K4)

13. (a) Briefly discuss about immuno-modulation. (CO3, K2)

Or

(b) Write short note on AIDS. (CO3, K2)

14. (a) Discuss about the autoimmune disorder. (CO4, K3)

Or

(b) Write short note on radio-immuno assay. (CO4, K4)

15. (a) Write short note on Western blot. (CO5, K2)

Or

(b) Discuss about the significance of immune-precipitation. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Write an account on Lymphoid organs and their role. (CO1, K3)

Or

(b) Give a detail account on antibody engineering. (CO1, K2)

17. (a) Discuss about the role of B-lymphocytes in immunity. (CO2, K2)

Or

(b) Discuss about formation, maturation and role of T-lymphocytes. (CO2, K3)

18. (a) Give an account on different types of hyper sensitivity. (CO3, K2)

Or

(b) Write about how the HIV evade the immune system and its control measures. (CO3, K3)

19. (a) Discuss about MHC and organ transplantation. (CO4, K4)

Or

(b) Discuss about the Complement system. (CO4, K2)

20. (a) Discuss about immuno-florescence and flow cytometry. (CO5, K2)

Or

(b) Write an account on different types of ELISA and their uses. (CO5, K2)

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R2797

Sub. Code
509203

M.Sc. DEGREE EXAMINATION, APRIL – 2025

Second Semester

Zoology

DEVELOPMENTAL BIOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option.

1. The egg contains large amount of yolk are (CO1, K2)

   (a) Macrolecithal egg (b) Megalecithal egg

   (c) Polylecithal egg (d) Microlecithal egg

2. Neurolemma is a (CO1, K2)

   (a) General covering (b) Sheath of Schwann

   (c) Special sheath (d) All of the above

3. Fertilization leads to (CO2, K2)

   (a) Segmentation of ovary

   (b) Segmentation of sperm

   (c) Segmentation of uterine tube

   (d) Segmentation of uterus

4. Human embryo is referred to as 'fetus' from beginning of (CO2, K2)

(a) 1st month of pregnancy

(b) 2nd month of pregnancy

(c) 3rd month of pregnancy

(d) 4th month of pregnancy

5. Liver is a derivative of (CO3, K5)

(a) Ectoderm (b) Endoderm

(c) Mesoderm (d) All of the above

6. Notochord is formed by _____ cells in invertebrates. (CO3, K5)

(a) Mesodermal (b) Ectodermal

(c) Epidermal (d) Endodermal

7. How many primary spermatocytes are required to form 16 spermatids? (CO4, K1)

(a) 4 (b) 6

(c) 8 (d) 10

8. The Direct interaction between cell surfaces called as (CO4, K1)

(a) Cell-Cell interaction

(b) Adhesion

(c) Signaling

(d) Communication

9. _____ is the study of aging. (CO5, K4)

(a) Physiology (b) Embryology

(c) Gerontology (d) Paleontology

10. Which of the following is an anti apoptotic protein? (CO5, K4)

(a) Bcl-Xs (b) Bfl 1

(c) Bim (d) NOXA

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Write short note on cell fate and cell lineages. (CO1, K2)

Or

(b) Explain the cell commitment and specification. (CO1, K2)

12. (a) Explain the ultrastructure of Ovary. (CO2, K2)

Or

(b) Briefly describe the types of cleavages. (CO2, K2)

13. (a) Explain about the Fate map. (CO3, K5)

Or

(b) Write short note about activation of egg. (CO3, K5)

14. (a) Describe pattern formation in *Drosophila*. (CO4, K1)

Or

(b) Explain about organogenesis. (CO4, K1)

15. (a) Give an account on (CO5, K4)

(i) WNT

(ii) BMP4

(iii) Activin

(iv) Noggin.

Or

(b) Write an account on nuclear transplantation. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Write an essay on cell differentiation at organ level. (CO1, K2)

Or

(b) Write an essay on stem cells. (CO1, K2)

17. (a) Explain in detail about the metabolic and molecular changes during gastrulation. (CO2, K2)

Or

(b) Describe in detail about types of eggs and their polarity. (CO2, K2)

18. (a) Describe in detail about morphogenic movements in mammals. (CO3, K5)

Or

(b) Discuss in detail about derivatives of ectoderm endoderm and mesoderm. (CO3, K5)

19. (a) Describe in detail about the development of limbs in amphibians. (CO4, K1)

Or

(b) Give an account on formation of brain and eye lens in chick. (CO4, K1)

20. (a) Define the role of HOX genes with special reference to drosophila. (CO5, K4)

Or

(b) What are factors involved in teratogenesis? Discuss in detail. (CO5, K4)

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R2798

Sub. Code
509204

M.Sc. DEGREE EXAMINATION, APRIL – 2025

Second Semester

Zoology

MICROBIOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option.

1. Father of Microbiology (CO1, K1)

   (a) Ferdinand Cohn (b) Edwin John Butler

   (c) Robert Koch (d) Antonie van Leeuwenhoek

2. Which microorganism(s) among the following perform photosynthesis by utilizing light? (CO1, K1)

   (a) Viruses (b) Cyanobacteria

   (c) Fungi (d) None of the above

3. Which of the following is a Complex media for fungal growth? (CO1, K1)

   (a) Nutrient broth

   (b) Luria-Bertani media

   (c) Potato Dextrose Agar (PDA) media

   (d) Mac Conkey Agar media

4. Lag phase is also known as _____. (CO1, K1)

(a) Period of initial adjustment

(b) Transitional period

(c) Generation time

(d) Period of rapid growth

5. Blue tongue disease mostly affects which of the following animal (CO2, K1)

(a) Fish (b) Sheep

(c) Donkey (d) Birds

6. Which of the following microorganism causes a bacterial disease in a poultry farm? (CO4, K2)

(a) *Ascaridia galli* (b) *Eimeria*

(c) Paramyxovirus (d) *Mycobacterium avium*

7. The most common fungal disease in poultry birds is _____. (CO4, K2)

(a) Candidiasis (b) Botulism

(c) Fowl pox (d) Marek's Disease

8. _____ is a gastrointestinal disease caused by protozoan parasites. (CO4, K2)

(a) Trypanosomiasis (b) Amoebiasis

(c) Ovine theileriosis (d) Coccidiosis

9. _____ bacteria responsible for curd formation. (CO5, K3)

(a) Lactobacillus (b) Pediococcus

(c) Zymomonas (d) Acetobacter

10. The bacterial genera which are often included in probiotic food are? (CO5, K3)

(a) Lactobacillus and bifidobacterium

(b) Lactobacillus and salmonella

(c) Lactobacillus and clostridium

(d) Bacillus and staphylococcus

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Explain briefly the structure and functions of bacterial cell wall. (CO1, K3)

Or

(b) Briefly explain the morphological features protozoa. (CO1, K2)

12. (a) Write a short note on bacterial growth curve. (CO2, K2)

Or

(b) Write a commonly used method for isolation of pure culture of bacterium. (CO2, K2)

13. (a) Write a short note on common viral disease in poultry. (CO3, K2)

Or

(b) Give an account on symptoms and control measure of Anthrax. (CO3, K3)

14. (a) Write a short note on Viral Zoonosis. (CO4, K4)

Or

(b) Discuss the causes, symptoms and control measure of ringworm in cattle. (CO4, K3)

15. (a) List the industrially useful microorganisms. (CO5, K3)

Or

(b) Write a short note on pasteurization. (CO5, K3)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Write the special staining techniques for microscopic identification of Microorganisms. (CO1, K3)

Or

(b) Write an essay on general characters of viruses. (CO4, K3)

17. (a) Explain the microbial growth curve in batch culture and explain the factors influencing growth curve. (CO2, K3)

Or

(b) Write the different methods of sterilization highlighting their principles involved. (CO1, K3)

18. (a) Give a brief account on the common bacterial disease in poultry. (CO3, K4)

Or

(b) Discuss the causes, symptoms, diagnosis and control of foot and mouth disease in cattle. (CO3, K3)

19. (a) Give an account of the pathology and pathogenesis of lung diseases in small ruminants. (CO4, K3)

Or

(b) Discuss the causes, symptoms and control measure of protozoan disease in poultry. (CO4, K3)

20. (a) Explain the process of probiotic production and discuss the applications of probiotics in health management. (CO5, K5)

Or

(b) Explain the causes, symptoms, and prevention strategies for microbial food poisoning caused by Salmonella species. (CO5, K5)

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R2799	Sub. Code
	509506

M.Sc. DEGREE EXAMINATION, APRIL – 2025

Second Semester

Zoology

Elective – ANIMAL BIOTECHNOLOGY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option.

1. The genetically modified organism (GMO) is _____. (CO1, K1)

   (a) An organism that has undergone natural selection

   (b) An organism with an altered DNA

   (c) An organism that has been cloned

   (d) An organism that is extinct

2. The process of amplification of DNA fragments is called (CO1, K1)

   (a) Cloning (b) Electroporation

   (c) Gene therapy (d) PCR

3. Which of the following is a tool commonly used in genetic engineering to cut DNA at specific site? (CO1, K1)

(a) Helicase

(b) Ligase

(c) Restriction enzyme

(d) Polymerase

4. Which of the following is the main function of a cloning vector? (CO1, K1)

(a) To carry foreign DNA into a host organism

(b) To replicate foreign DNA within a host organism

(c) To degrade foreign DNA in the host organism

(d) To express foreign DNA as a protein

5. _____ methods are used for sequencing DNA using chain-terminating nucleotides. (CO2, K1)

(a) Maxam and Gilbert sequencing

(b) Sanger's dideoxy sequencing

(c) Pyrosequencing

(d) Hybridization sequencing

6. _____ molecular technique is used for creating a DNA profile for identification purposes, often in forensic science. (CO4, K2)

(a) DNA sequencing

(b) PCR-based sequencing

(c) Chromosome walking

(d) DNA fingerprinting

7. Who is known as the father of tissue culture? (CO4, K2)

(a) Harrison (b) Arnold

(c) Ross (d) Roux

8. Cell culture techniques became simpler only after the advent of (CO4, K2)

(a) Antibiotics

(b) Trypsin

(c) Cell culture media

(d) All of the following

9. What is the primary purpose of artificial insemination in cattle? (CO5, K3)

(a) Control the breeding schedule

(b) Increase genetic diversity

(c) Reduce the need for male cattle

(d) All of the above

10. What is the purpose of cryopreservation in the context of animal reproduction? (CO5, K3)

(a) To store embryos or sperm for future use

(b) To increase the success rate of artificial insemination

(c) To induce superovulation

(d) To improve fertility rates in older cattle

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Write a short note on animal cell culture and its importance. (CO1, K3)

Or

(b) Briefly discuss the applications of biotechnology in industries. (CO1, K2)

12. (a) Write short notes on the key features of the plasmid vector pBR322. (CO2, K2)

Or

(b) What are the characteristics of vectors? (CO2, K2)

13. (a) Write a short note on nucleic acids manipulating enzymes used in recombinant DNA technology. (CO3, K2)

Or

(b) A brief account on the process and significance of DNA fingerprinting. (CO3, K3)

14. (a) Briefly discuss about primary cell culture. (CO4, K4)

Or

(b) What are the uses of stem cell culture in regenerative medicine? (CO4, K3)

15. (a) Explain the process of artificial insemination in cattle. (CO5, K3)

Or

(b) Discuss about the role of cryopreservation in animal breeding. (CO5, K3)

Part C ($5 \times 8 = 40$)

Answer **all** the questions not more than 1000 words each.

16. (a) Draw the structure of an animal cell and explain the functions of cell organelles. (CO1, K3)

Or

(b) Describe the principles and uses of recombinant DNA technology. (CO4, K3)

17. (a) Explain the structure and uses of any three vectors used in rDNA technology. (CO2, K3)

Or

(b) Write an essay on construction and application of gene library in genetic engineering. (CO1, K3)

18. (a) Describe the process of gene therapy and its potential applications in treating genetic disorders. (CO3, K4)

Or

(b) Explain the principles of DNA microarrays and their applications in genomics. (CO3, K3)

19. (a) Discuss the development of cell lines and their applications in biotechnology. (CO4, K3)

Or

(b) Discuss the production of pharmaceutical products using animal cell culture. (CO4, K3)

20. (a) Discuss the role of stem cell technology in targeted gene transfer and transgenics. (CO5, K5)

Or

(b) Explain gene pharming and its applications in pharmaceutical industry. (CO3, K3)

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